



DIRECT VIEW DISPLAYS

ARMY	REO	253	00003H09	380	28
DAWS	ON	169	---0RT00357T00	50	
LDRTQ	HJT	085	00 -- HTO		350

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STROMBERG-CARLSON

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Recognizing the need for modern information displays with improved man-machine links, Stromberg-Carlson's Data Products Organization has capitalized on their years of experience in display development, from SAGE (1955) to Apollo/IMCC (1965), and has developed a completely new series of direct view displays. Each incorporates the latest display techniques with solid-state electronics. The consoles, operating with high speed data processing systems and communications links, present the widest range of alphanumeric and graphic information on a variety of viewing screens. Coupled with its other equipments, techniques and systems, these displays provide Stromberg-Carlson with the broadest information handling product line in the industry.

Applications for the display consoles are found in business, scientific and military organizations, wherever a large volume of data must be presented to an operator for action or monitoring purposes. The following are a few of the many applications:

1. *Computer Systems*

- a. Displays of information needed in program development and debugging.
- b. Monitoring of computer operations at the center or as a readout device at locations remote from the data processing lab.
- c. Retrieval of stored data.

2. *Man-Machine Data Systems*

- a. Command Control Systems.
- b. Commercial monitoring and control.
- c. Management information systems.
- d. Traffic control.
- e. Teaching machine methods.

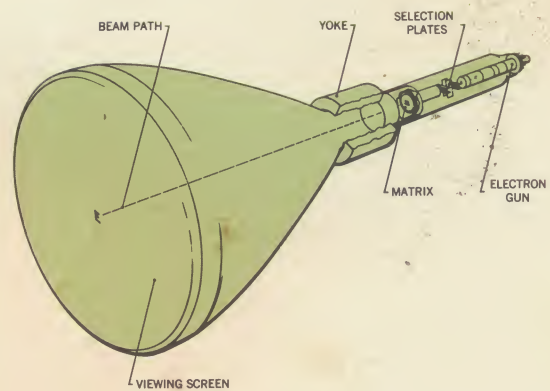
3. *Digital Systems Development*

- a. Simulation techniques.
- b. Equipment evaluation.
- c. Automatic drafting.
- d. Display technique evaluation.

In each of these typical applications, the Stromberg-Carlson display serves as a highly effective man-machine language translator and allows an effectiveness of system usage otherwise impossible.

CHARACTRON® SHAPED BEAM TUBE

The heart of many Stromberg-Carlson display systems is the CHARACTRON Shaped Beam Tube, the most precise and fastest known method of character generation available today. The inherent simplicity of the well-known matrix, beam-shaping technique employed in the CHARACTRON Tube makes possible display systems of unmatched overall quality. This is particularly true of character-symbol definition. Lower system error

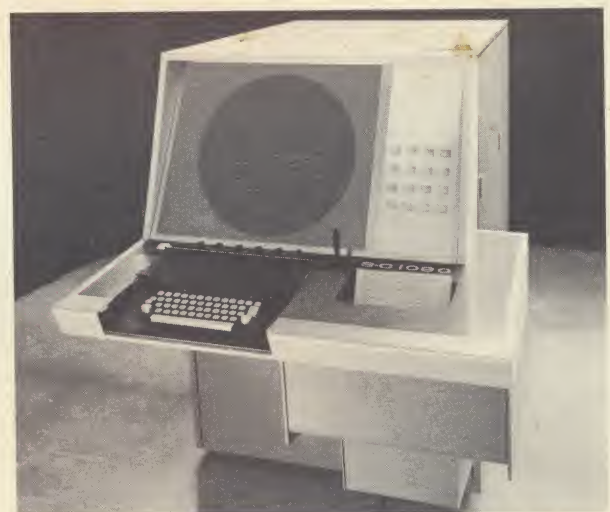


rates and fatigue indices are made possible. Greater system efficiency is also available through more complex symbol coding. Yet, due to the "one shot" method of character formation, all this is accomplished with generally simpler electronics than would be required for stroke or dot type character generators. The tube, however, is not limited to the characters and symbols in the matrix. By using a spot writing mode, the tubes draw analog information of any type including TV, radar, pictorials, etc.

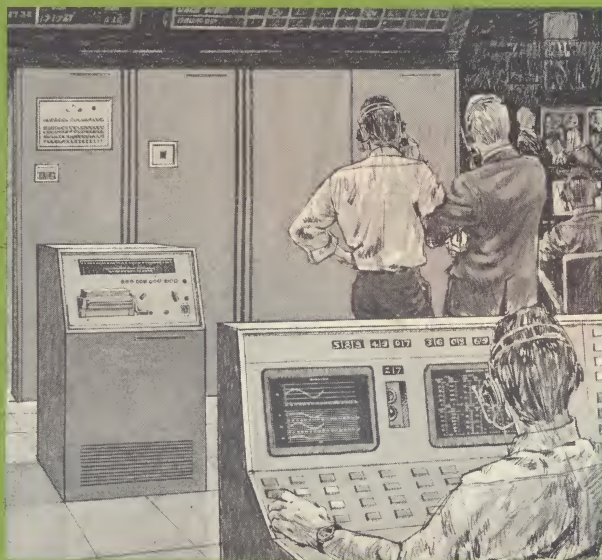
DISPLAY CONSOLES

Stromberg-Carlson displays are designed to meet specific systems requirements. Typical consoles which have proven successful in operation are:

1. *Standard Display Console:* In this system alphanumeric and graphic information is displayed directly on the face of the CHARACTRON Tube. The console may be equipped with options such as keyboards, function or category keys, light pens, and joystick and ball cursors which enable the operator to communicate with the data source. The display shown has a built-in line printer for the production of paper copies of the displayed materials. In addition, the consoles can operate with separate printers or with microfilm recording systems.



2. *Digital-To-Video Displays:* Where a number of operators at remote locations require information from a data source, this system provides the economical answer. Data are displayed on the tube face within the system and are photographed by a video camera. The information is then transmitted to TV monitors. Operators of the TV monitors may select data from several channels which include alphanumeric, graphic or regular video data.



3. *Special Purpose Displays:* Stromberg-Carlson has produced display consoles for a variety of special purposes including compact, miniaturized consoles for military use where space is severely limited. The illustrated display is a type developed for use aboard military aircraft. These special purpose consoles are also suitable for shipboard, spacecraft, or other mobile operations.



4. *Computer Interrogation Equipment:* These desktop consoles permit high-speed random access to computer stored data. Using the keyboard, the operator requests data from the computer memory. The data are then displayed within seconds on the console's cathode ray tube. The equipment includes a self-



contained memory which holds the data until they are erased. The memory permits operation in conjunction with a printer or telecommunication system. The consoles may be used at locations remote from the computer lab and provide one of the fastest known methods for retrieval of stored information.

OPTIONAL EQUIPMENT

Stromberg-Carlson display consoles may be equipped with many options including:

Special Window Tube: Stromberg-Carlson developed the first practical "rear-window" tube many years ago. Used for both photographic recording and rear projection, this development has made possible a real step forward in relieving the computer of unnecessary information generation. Such slowly changing data as map overlays, contours, charts, and business forms can be selected from a slide library and projected directly onto the viewing screen of the cathode ray tube. The projected data, in color if desired, is viewed without parallax or distortion simultaneously with the dynamic data generated by the electron beam of the CRT. The system saves the computer time which would have been required to repeat the infrequently changed material.

Time Share Tube: In this tube all alphanumeric data are presented using the character-shaping principle while raster and spiral scanning are accomplished by projecting the electron beam through a special aperture in the matrix for spot writing. The single tube can display a video picture, a radar report and characters and symbols with shaped beam resolution in a sequential manner, but rapidly enough to allow flicker free simultaneous display.

Two-Gun Tube: One gun produces characters and symbols while a second gun generates high resolution video images including scan converter readout or raw radar data. Both guns operate simultaneously and separately without interference.

Magnetic Core Buffers: Provides 1024, 4096 or larger dynamic storage for continuous display on the console screen. The buffer reduces computer output requirements and allows keyboard entry into the local memory for editing, composing and similar functions.

Vector Generator: Produces straight line segments of specified length and direction upon receipt of a digital command. Allows generation of specially shaped or very large characters.

Function Keys: Special purpose keys can be included in any of these consoles to provide special interrogation or response codes or signal lines to the data source.

Category Selection: Allows operator to inhibit presentation of entire categories of information without interrupting the computer or data system.

Expansion/Off-Centering: Permits expansion of selected segments of the display. A choice of digital or analog off-centering is provided.

Light Pen/Cursors: These options, which include light pens, as well as joystick and ball cursors, enable an operator to transfer indicated (hooked) information on the tube face to the computer, or to edit, compose, or otherwise communicate with the data source.

Data Entry: Keyboards make it possible to enter a variety of data, make data source inquiries or provide other man-machine communications.

Multiple Channels Per Display: Several separate displays may be presented on a single tube face to provide separate but simultaneous data.

Color TV Displays: When multiple displays are presented on a single tube face, a separate TV camera can be aimed at each of the displays. Each camera can present its display in a different color to a color monitor. By combining the data presented by the several different cameras, a multi-colored display can be created.

ADDITIONAL CAPABILITIES

Large Screen Displays: Where group viewing of information is a requirement, Stromberg-Carlson's systems generate the most accurate alphanumeric and graphic images available for large screen film projection. The precision achieved is so great that images produced sequentially by the CHARAC-

TRON Tube may be effectively overlaid on each other for purposes of color combination. This overlaying technique is used to produce colored wall displays. Information presented by the tube may be automatically microfilmed. Slides of film strips produced can then be shown on regular or color projectors. Stromberg-Carlson also maintains a high degree of proficiency in dynamic large screen presentation methods and has developed its own proprietary position in light valve techniques.

System Engineering: Stromberg-Carlson maintains a fully equipped human factors/systems engineering and development force to assist in your system design. Government and internally funded studies completed by this group of display specialists include defense system displays, large screen display techniques, cathode ray tube color, flicker characteristics, military airborne display configurations, and management information system design.

CHARACTERISTICS

The following specifications provide a general view of Stromberg-Carlson equipment.

Cathode Ray Tubes: Many of the Stromberg-Carlson displays employ the CHARACTRON Shaped Beam Tube. In others, highly reliable, very economical electronic character generators are used. Most of the tubes are 5 to 21 inches in diameter. Standard and custom phosphors available to suit requirements.

Character Size: Typical character sizes range from 0.080 to 0.200 inch height. Variable character size available.

Character Repertoire: Characters normally provided include the alphanumeric series, punctuation marks, and special symbols. Repertoires of 64, 96, 180 or more characters available.

Focused Spot Size: Typically 0.010 to 0.020 inches.

Brightness: 20 to 100 foot lamberts.

Resolution: Character resolution of 4,000 to 6,000 lines per display diameter.

Vector Characteristics: Length—Spot size to full diameter.

OTHER DATA PRODUCTS OF STROMBERG-CARLSON INCLUDE:



S-C 4400 Document Recorder



S-C 3070 Electronic Printer



S-C 4020 Computer Recorder

STROMBERG-CARLSON CORPORATION

DATA PRODUCTS—SAN DIEGO

Phone 298-6131, Area Code 714

P.O. Box 2449, San Diego, California 92112



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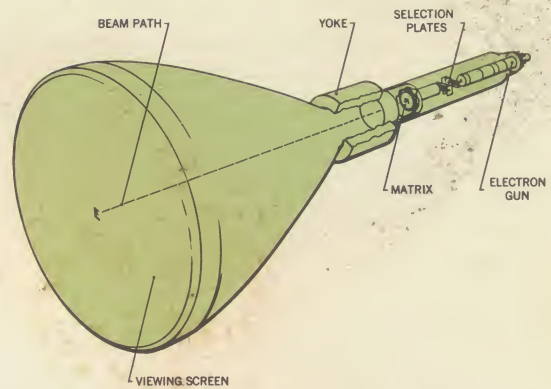
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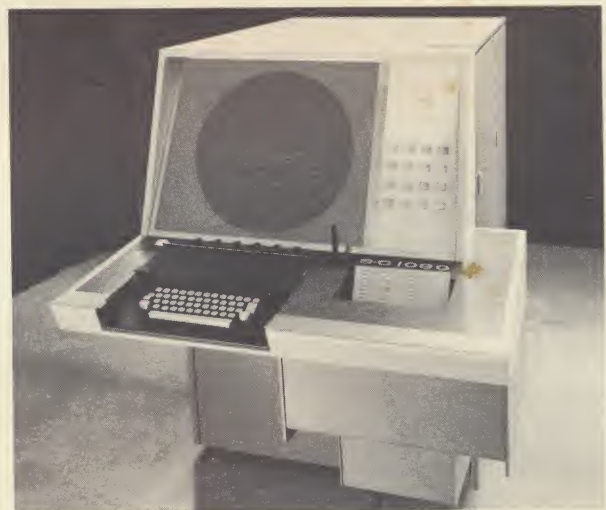


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